



Dart Aerospace Ltd.  
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Hawkesbury, ON  
K6A 1K7  
Canada

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4

**D212-664-201TRN**  
**Job Sheet 195552**



**Part No:** D212-664-201TRN

**Job Qty:** 1 pcs

**Part Name:** Crosstube Turning Detail



**Part Weight:** 0 lbs

**Status:** New

**Priority:** Medium

**Job Created:** 5/27/19

**Job Tracking No:**

**Due Date:** 6/7/19

**Created By:** Marie Lajeunesse

**Type:** Stock

**Description:**

**Note:** D212-664-241 REV E IPP Rev:A 08-03-06 new issue DD verified by:ec IPP Rev B 08.04.02 Removed polish EC verified DD

**Ship Via:**

### Bill of Materials

### Job Routing

| Op<br>No | Operation            | Qty   | Start Date | Due<br>Date | Standard |      | Workcenter/Supplier   |  | Lead Time | DAS  | Sign-off   |
|----------|----------------------|-------|------------|-------------|----------|------|-----------------------|--|-----------|------|------------|
|          |                      |       |            |             | Setup    | Run  | Workcenter / Supplier |  |           |      |            |
| 100      | Mori Seiki TL-40 - 1 | 1 pcs | 6/7/19     | 6/7/19      | 0.00     | 1.33 | Mori Seiki TL-40 - 1  |  |           | 66   | 2019/07/30 |
| 110      | QC 2                 | 1 pcs | 6/7/19     | 6/7/19      | 0.00     | 0.00 | QC 2 - 1              |  |           | 9-89 |            |
|          |                      |       |            |             |          |      | QC 2 - 12             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 14             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 17             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 19             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 2              |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 20             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 22             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 23             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 25             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 32             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 33             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 35             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 39             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 4              |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 40             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 44             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 45             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 48             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 49             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 50             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 51             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 52             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 57             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 62             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 63             |  |           |      |            |
|          |                      |       |            |             |          |      | QC 2 - 8              |  |           | DAS  |            |
|          |                      |       |            |             |          |      | QC 2 - 66             |  |           | 66   | 2019/07/30 |
|          |                      |       |            |             |          |      | QC 2 - 64             |  |           | 9-89 |            |

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|     |                            |       |        |           |                            |                             |
|-----|----------------------------|-------|--------|-----------|----------------------------|-----------------------------|
|     |                            |       |        |           | QC 2 - 65                  |                             |
|     |                            |       |        |           | QC 2 - 5                   |                             |
|     |                            |       |        |           | QC 2 - 71                  |                             |
|     |                            |       |        |           | QC 2 - 73                  |                             |
|     |                            |       |        |           | QC 2 - 69                  |                             |
| 120 | Mori Seiki TL-40 - 1 - B4B | 1 pcs | 6/7/19 | 0.00 1.33 | Mori Seiki TL-40 - 1 - B4B | DAS<br>662019-07-31<br>9-89 |
| 130 | QC 2                       | 1 pcs | 6/7/19 | 0.00 0.00 | QC 2 - 1                   |                             |
|     |                            |       |        |           | QC 2 - 12                  |                             |
|     |                            |       |        |           | QC 2 - 14                  |                             |
|     |                            |       |        |           | QC 2 - 17                  |                             |
|     |                            |       |        |           | QC 2 - 19                  |                             |
|     |                            |       |        |           | QC 2 - 2                   |                             |
|     |                            |       |        |           | QC 2 - 20                  |                             |
|     |                            |       |        |           | QC 2 - 22                  |                             |
|     |                            |       |        |           | QC 2 - 23                  |                             |
|     |                            |       |        |           | QC 2 - 25                  |                             |
|     |                            |       |        |           | QC 2 - 32                  |                             |
|     |                            |       |        |           | QC 2 - 33                  |                             |
|     |                            |       |        |           | QC 2 - 35                  |                             |
|     |                            |       |        |           | QC 2 - 39                  |                             |
|     |                            |       |        |           | QC 2 - 4                   |                             |
|     |                            |       |        |           | QC 2 - 40                  |                             |
|     |                            |       |        |           | QC 2 - 44                  |                             |
|     |                            |       |        |           | QC 2 - 45                  |                             |
|     |                            |       |        |           | QC 2 - 48                  |                             |
|     |                            |       |        |           | QC 2 - 49                  |                             |
|     |                            |       |        |           | QC 2 - 50                  |                             |
|     |                            |       |        |           | QC 2 - 51                  |                             |
|     |                            |       |        |           | QC 2 - 52                  |                             |
|     |                            |       |        |           | QC 2 - 57                  |                             |
|     |                            |       |        |           | QC 2 - 62                  |                             |
|     |                            |       |        |           | QC 2 - 63                  |                             |
|     |                            |       |        |           | QC 2 - 8                   |                             |
|     |                            |       |        |           | QC 2 - 66                  | DAS<br>662019-07-31<br>9-89 |
|     |                            |       |        |           | QC 2 - 64                  |                             |
|     |                            |       |        |           | QC 2 - 65                  |                             |
|     |                            |       |        |           | QC 2 - 5                   |                             |
|     |                            |       |        |           | QC 2 - 71                  |                             |
|     |                            |       |        |           | QC 2 - 73                  |                             |
|     |                            |       |        |           | QC 2 - 69                  |                             |
| 140 | QC 8                       | 1 pcs | 6/7/19 | 0.00 0.00 | QC 8 - 12                  |                             |
|     |                            |       |        |           | QC 8 - 14                  |                             |
|     |                            |       |        |           | QC 8 - 17                  |                             |
|     |                            |       |        |           | QC 8 - 20                  |                             |
|     |                            |       |        |           | QC 8 - 25                  |                             |
|     |                            |       |        |           | QC 8 - 3                   |                             |
|     |                            |       |        |           | QC 8 - 32                  |                             |
|     |                            |       |        |           | QC 8 - 33                  |                             |
|     |                            |       |        |           | QC 8 - 35                  |                             |
|     |                            |       |        |           | QC 8 - 39                  |                             |
|     |                            |       |        |           | QC 8 - 4                   |                             |
|     |                            |       |        |           | QC 8 - 44                  |                             |
|     |                            |       |        |           | QC 8 - 45                  |                             |
|     |                            |       |        |           | QC 8 - 49                  |                             |
|     |                            |       |        |           | QC 8 - 58                  |                             |
|     |                            |       |        |           | QC 8 - 8                   |                             |
|     |                            |       |        |           | QC 8 - 9                   |                             |
|     |                            |       |        |           | QC 8 - 68                  |                             |
|     |                            |       |        |           | QC 8 - 67                  |                             |



|     |                             |       |        |           |                         |  |
|-----|-----------------------------|-------|--------|-----------|-------------------------|--|
|     |                             |       |        |           | QC 8 - 1 (A)            |  |
|     |                             |       |        |           | QC 8 - 47               |  |
|     |                             |       |        |           | QC 8 - 40               |  |
|     |                             |       |        |           | QC 8 - 52               |  |
|     |                             |       |        |           | QC 8 - 23               |  |
|     |                             |       |        |           | QC 8 - 57               |  |
|     |                             |       |        |           |                         |  |
| 145 | Crosstubes - 2 - B4B        | 1 pcs | 6/7/19 | 0.00 0.25 | Crosstubes - 1 - B4B    |  |
|     |                             |       |        |           | Crosstubes - 2 - B4B    |  |
|     |                             |       |        |           | Crosstubes - 3 - B4B    |  |
|     |                             |       |        |           | Crosstubes - 4 - B4B    |  |
| 150 | Crosstubes - Bend - 2 - B4B | 1 pcs | 6/7/19 | 0.00 0.25 | Crosstubes - Bend - B4B |  |
|     |                             |       |        |           |                         |  |
| 160 | QC 7                        | 1 pcs | 6/7/19 | 0.00 0.00 | QC 7 - 10               |  |
|     |                             |       |        |           | QC 7 - 13               |  |
|     |                             |       |        |           | QC 7 - 14               |  |
|     |                             |       |        |           | QC 7 - 15               |  |
|     |                             |       |        |           | QC 7 - 17               |  |
|     |                             |       |        |           | QC 7 - 18               |  |
|     |                             |       |        |           | QC 7 - 19               |  |
|     |                             |       |        |           | QC 7 - 2                |  |
|     |                             |       |        |           | QC 7 - 28               |  |
|     |                             |       |        |           | QC 7 - 3                |  |
|     |                             |       |        |           | QC 7 - 30               |  |
|     |                             |       |        |           | QC 7 - 34               |  |
|     |                             |       |        |           | QC 7 - 36               |  |
|     |                             |       |        |           | QC 7 - 37               |  |
|     |                             |       |        |           | QC 7 - 41               |  |
|     |                             |       |        |           | QC 7 - 47               |  |
|     |                             |       |        |           | QC 7 - 48               |  |
|     |                             |       |        |           | QC 7 - 51               |  |
|     |                             |       |        |           | QC 7 - 58               |  |
|     |                             |       |        |           | QC 7 - 59               |  |
|     |                             |       |        |           | QC 7 - 60               |  |
|     |                             |       |        |           | QC 7 - 9                |  |
|     |                             |       |        |           | QC 7 - 68               |  |
|     |                             |       |        |           | QC 7 - 50               |  |
|     |                             |       |        |           | QC 7 - 67               |  |
|     |                             |       |        |           | QC 7 - 40               |  |
|     |                             |       |        |           | QC 7 - 24               |  |
|     |                             |       |        |           | QC 7 - 43               |  |
| 170 | Packaging 3-1 - Stock - B4B | 1 pcs | 6/7/19 | 0.00 0.00 | Packaging 3 - 1 - B4B   |  |
|     |                             |       |        |           | Packaging 3 - 2 - B4B   |  |
|     |                             |       |        |           | Packaging 3 - 3 - B4B   |  |
|     |                             |       |        |           | Packaging 3 - 4 - B4B   |  |
|     |                             |       |        |           | Packaging 3 - 5 - B4B   |  |
|     |                             |       |        |           | Packaging 3 - 6 - B4B   |  |
|     |                             |       |        |           | Packaging 3 - 7 - B4B   |  |
|     |                             |       |        |           | Packaging 3 - 8 - B4B   |  |
|     |                             |       |        |           | Packaging 3 - 9 - B4B   |  |
|     |                             |       |        |           | Packaging 3 - 10 - B4B  |  |
|     |                             |       |        |           | Packaging 3 - 11 - B4B  |  |
|     |                             |       |        |           | Packaging 3 - 12 - B4B  |  |
|     |                             |       |        |           | Packaging 3 - 13 - B4B  |  |
|     |                             |       |        |           | Packaging 3 - 14 - B4B  |  |
|     |                             |       |        |           | Packaging 3 - 15 - B4B  |  |
|     |                             |       |        |           | Packaging 3 - 16 - B4B  |  |
|     |                             |       |        |           | Packaging 3 - 17 - B4B  |  |
|     |                             |       |        |           | Packaging 3 - 18 - B4B  |  |
|     |                             |       |        |           | Packaging 3 - 19 - B4B  |  |
|     |                             |       |        |           | Packaging 3 - 20 - B4B  |  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          |                        |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------|--------------------------|------------------------|--|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 21 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 22 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 23 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 24 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 25 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 26 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 27 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 28 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 29 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 30 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 31 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 32 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 33 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 34 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 35 - B4B |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | Packaging 3 - 36 - B4B |  |
| 180 QC 21 - SA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 pcs                 | 6/7/19          | 0.00 0.00                | QC 21 - SA - 21        |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | QC 21 - SA - 70        |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |                 |                          | QC 21 - SA - 53        |  |
| <p>Part Op 100 - Mori Seiki TL-40 (Mori Seiki CNC Lathe Large) 1-Fill tube with sand &amp; install plugs DT8534 on both ends as per Descriptions: Folio FA114 2-Turn first side as per Folio FA114</p> <p>110 - (QC2- Inspect parts off machine FAI/FAIB)</p> <p>120 - Mori Seiki TL-40 (Mori Seiki CNC Lathe Large) 1-Turn second side as per Folio FA114</p> <p>130 - (QC2- Inspect parts off machine FAI/FAIB)</p> <p>140 - (QC8- Inspect parts - second check)</p> <p>145 - (Crosstubes) GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.</p> <p>150 - Crosstubes) 1- handfinish X-TUBE INSIDE AND OUT</p> <p>160 - (QC7-Inspect Chemical Conversion Coat)</p> <p>170 - (Identify as per dwg &amp; Stock Location: _____) Identify and stock in kanban rack Location: _____</p> <p>180 - (QC21- Final Inspection - Work Order Release)</p> |                       |                 |                          |                        |  |
| <b>Job BOM</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                       |                 |                          |                        |  |
| <b>Part / Item</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Component Name</b> | <b>Quantity</b> | <b>Operation</b>         | <b>Container</b>       |  |
| D6006-129                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Crosstube Material    | 1 pcs (1 ea)    | 100-Mori Seiki TL-40 - 1 | F123967                |  |
| <b>Job Allocations</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |                 |                          |                        |  |
| <b>Operation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Component Part</b> | <b>Required</b> | <b>Inventory</b>         | <b>Allocated</b>       |  |
| 100-Mori Seiki TL-40 - 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | D6006-129             | 1               | 53                       | 0                      |  |
| <b>Part Specifications</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                       |                 |                          |                        |  |
| Specifications could not be found.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                       |                 |                          |                        |  |

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Container No: S201384



Part: D212-664-201TRN

Job No: 195552

Serial No/Batch: S201384

Revision: E

Inspector:

Exp Date:

Instructions:

Date: 07/30/19



④

|                                                           |                     |              |
|-----------------------------------------------------------|---------------------|--------------|
| <b>DART AEROSPACE LTD</b>                                 | <b>Work Order:</b>  | 155552       |
| <b>Description:</b> Crosstube Assembly (205/212 High Aft) | <b>Part Number:</b> | D212-664-241 |
| <b>Inspection Dwg:</b> D212-664-241 <b>Rev:</b> E         |                     | Page 1 of 2  |

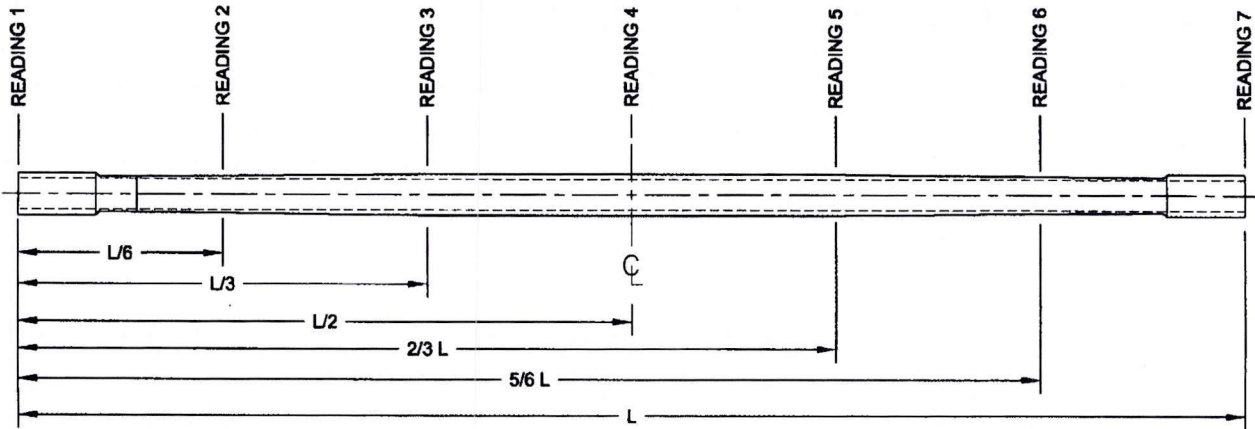
### FIRST ARTICLE INSPECTION CHECKLIST

| Inspection Sheet<br>Drawing Dimension | Tolerance | Actual<br>Dimension | Accept   | Reject | Method of<br>Inspection | Comments |
|---------------------------------------|-----------|---------------------|----------|--------|-------------------------|----------|
| SIDE A                                | 0.200     | +/-0.010            | .210 ✓   |        | CNC-08                  |          |
|                                       | R0.063    | +/-0.010            | .063 ✓   |        | RG                      |          |
|                                       | 2.990     | +0.005/-0.000       | 2.993 ✓  |        | CNC-04                  |          |
|                                       | 5.237     | +/-0.030            | 5.241 ✓  |        | CNC-08                  |          |
|                                       | 2.600     | +0.005/-0.000       | 2.604 ✓  |        | CNC-04                  |          |
|                                       | 2.686     | +0.005/-0.000       | 2.690 ✓  |        |                         |          |
|                                       | 2.770     | +0.005/-0.000       | 2.775 ✓  |        |                         |          |
|                                       | 2.854     | +0.005/-0.000       | 2.858 ✓  |        |                         |          |
|                                       | 2.938     | +0.005/-0.000       | 2.942 ✓  |        |                         |          |
|                                       | 3.021     | +0.005/-0.000       | 3.025 ✓  |        | CNC-05                  |          |
|                                       | 3.133     | +0.005/-0.000       | 3.138 ✓  |        | "                       |          |
|                                       | 3.179     | +0.005/-0.000       | 3.184 ✓  |        | "                       |          |
|                                       |           |                     |          |        |                         |          |
|                                       |           |                     |          |        |                         |          |
| SIDE B                                | 0.200     | +/-0.010            | .207 ✓   |        | CNC-08                  |          |
|                                       | R0.063    | +/-0.010            | .063 ✓   |        | RG                      |          |
|                                       | 2.990     | +0.005/-0.000       | 2.994 ✓  |        | CNC-04                  |          |
|                                       | 5.237     | +/-0.030            | 5.230 ✓  |        | CNC-08                  |          |
|                                       | 2.600     | +0.005/-0.000       | 2.605 ✓  |        | CNC-04                  |          |
|                                       | 2.686     | +0.005/-0.000       | 2.691 ✓  |        |                         |          |
|                                       | 2.770     | +0.005/-0.000       | 2.775 ✓  |        |                         |          |
|                                       | 2.854     | +0.005/-0.000       | 2.858 ✓  |        |                         |          |
|                                       | 2.938     | +0.005/-0.000       | 2.941 ✓  |        |                         |          |
|                                       | 3.021     | +0.005/-0.000       | 3.025 ✓  |        | CNC-05                  |          |
|                                       | 3.133     | +0.005/-0.000       | 3.138 ✓  |        | "                       |          |
|                                       | 3.179     | +0.005/-0.000       | 3.184 ✓  |        | "                       |          |
|                                       | 124.362   | +/-0.020            | 124.36 ✓ |        | Tape                    |          |
|                                       |           |                     |          |        |                         |          |
|                                       |           |                     |          |        |                         |          |

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|                                                           |                                  |
|-----------------------------------------------------------|----------------------------------|
| <b>DART AEROSPACE LTD</b>                                 | <b>Work Order:</b> 191572        |
| <b>Description:</b> Crosstube Assembly (205/212 High Aft) | <b>Part Number:</b> D212-664-241 |
| <b>Inspection Dwg:</b> D212-664-241 <b>Rev:</b> E         | <b>Page 2 of 2</b>               |

### WALL THICKNESS MEASUREMENT



| Location               | WALL THICKNESS MEASUREMENT (IN) |      |      |      | Deviation<br>$\Delta w$<br>(max-min) | TOLERANCE |
|------------------------|---------------------------------|------|------|------|--------------------------------------|-----------|
|                        | w1                              | w2   | w3   | w4   |                                      |           |
| READING 1<br>L= 0"     | .418                            | .384 | .377 | .423 | .046                                 | 0.062"    |
| READING 2<br>L= 20.73  | .309                            | .316 | .336 | .331 | .027                                 |           |
| READING 3<br>L= 41.45  | .499                            | .486 | .480 | .484 | .019                                 |           |
| READING 4<br>L= 62.18  | .543                            | .533 | .521 | .526 | .022                                 |           |
| READING 5<br>L= 82.91  | .503                            | .495 | .483 | .482 | .021                                 |           |
| READING 6<br>L= 103.64 | .315                            | .323 | .321 | .311 | .012                                 |           |
| READING 7<br>L= 124.36 | .408                            | .391 | .391 | .420 | .029                                 |           |

#### Calibration Result

Actual Block Thickness: 200-500

Sitescan 250 Measured Thickness: 200-500

|                                 |                       |                              |
|---------------------------------|-----------------------|------------------------------|
| <b>Measured by:</b> DAS 66 9-89 | <b>Audited by:</b> TW | <b>Preliminary Approval:</b> |
| <b>Date:</b> 2019-07-31         | <b>Date:</b> 19-08-12 | <b>Date:</b>                 |

| Rev | Date     | Change                           | Revised by | Approved |
|-----|----------|----------------------------------|------------|----------|
| A   | 05.04.27 | New Issue (P/O D412-664-201)     | KJ/JLM     |          |
| B   | 06.03.09 | Tolerance for 5.237 was +/-0.001 | KJ/JLM     |          |
| C   | 07.05.08 | Dwg Rev. updated                 | KJ/JLM     |          |
| D   | 10.08.03 | Dimension 124.362 was 124.36     | KJ         |          |
| E   | 12.06.04 | Wall thickness form added        | KJ         |          |
| F   | 15.03.03 | Dwg Rev updated                  | KJ         |          |



| Item | Qty<br>-241 | Qty<br>-241B | Part Number     | Description                           |
|------|-------------|--------------|-----------------|---------------------------------------|
| 1    | X           |              | D212-664-241    | CROSSTUBE ASSEMBLY (205/212 HIGH AFT) |
| 2    |             | X            | D212-664-241B   | CROSSTUBE ASSEMBLY (214 HIGH AFT)     |
| 3    | 1           | 1            | D6006-129       | CROSSTUBE                             |
| 4    | 2           |              | D2940-1         | SUPPORT                               |
| 5    | 4           | 4            | D3595-063-530   | RUBBER CUSHION                        |
| 6    |             | 2            | D5018-1         | SUPPORT                               |
| 7    | 4           | 4            | MS21920-28      | CLAMP (OR MS21920-30)                 |
| 8    | A/R         | A/R          | PROSEAL 890 B-2 | SEALANT, AMS-S-8802 CLASS B-2         |

#### GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6006-129  
FINISHED LENGTH = 124.362±0.020
- FINISH: a) CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
b) PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
c) MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2 / C6-3, HATCHED AREA)  
d) PAINT OUTSIDE PER DART QSI 005 4.2  
e) REMOVE MASKING AND APPLY MATTE CLEAR COAT
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: D212-664-241/-241B = 44.2 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

#### MACHINING

- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.

#### BENDING

- BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7.2% (BASED ON O.D.) IN LOWER HALF OF R35.5 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.

#### ASSEMBLY

- INSTALL D2940-1 / D5018-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE ON TOP SIDE OF CROSSTUBE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

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|            |                                                                                                                                                                                                                                                                                                 |    |          |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------|
| E          | D5018-1 WAS D2940-1 (-241B), PROSEAL WAS MAGNOBOND, NOTE 2: ADD INSPECTION WINDOW, NOTE 11: ALLOW 7.2% CRUSH, NOTE 15: ADD 72HR CURE AND RETORQUE FOR PROSEAL, ADD SHEET 3, CLAMPS REVERSED TO PREVENT CHAFING (ZN B7-2, B7-3), BEND HEIGHT TOL. NOW 0.25 WAS 0.13 (C1-4), INCORP DEO D-1/2     | CP | 14.04.01 |
| D          | REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -241B (ZN D4-2, B4-2); REMOVED REF & ADD TOLERANCES (ZN D8-3 & C4-3, C6-3 & A8-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4 | RF | 09.09.30 |
| C          | REMOVE -1009 ABRASION STRIP; ADD MAGNOBOND 8398, CUSHION, REVERSE CLAMPS                                                                                                                                                                                                                        | PH | 07.03.08 |
| B          | ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES                                                                                                                                                                                                                                               | PH | 05.02.04 |
| A          | NEW ISSUE                                                                                                                                                                                                                                                                                       | CP | 00.12.12 |
| REV.       | DESCRIPTION                                                                                                                                                                                                                                                                                     | BY | DATE     |
| DESIGN     |                                                                                                                                                                                                                                                                                                 |    |          |
| DRAWN      |                                                                                                                                                                                                                                                                                                 |    |          |
| CHECKED    |                                                                                                                                                                                                                                                                                                 |    |          |
| MFG. APPR. |                                                                                                                                                                                                                                                                                                 |    |          |
| APPROVED   |                                                                                                                                                                                                                                                                                                 |    |          |
| DE APPR.   |                                                                                                                                                                                                                                                                                                 |    |          |
| DATE       | 14.04.01                                                                                                                                                                                                                                                                                        |    |          |

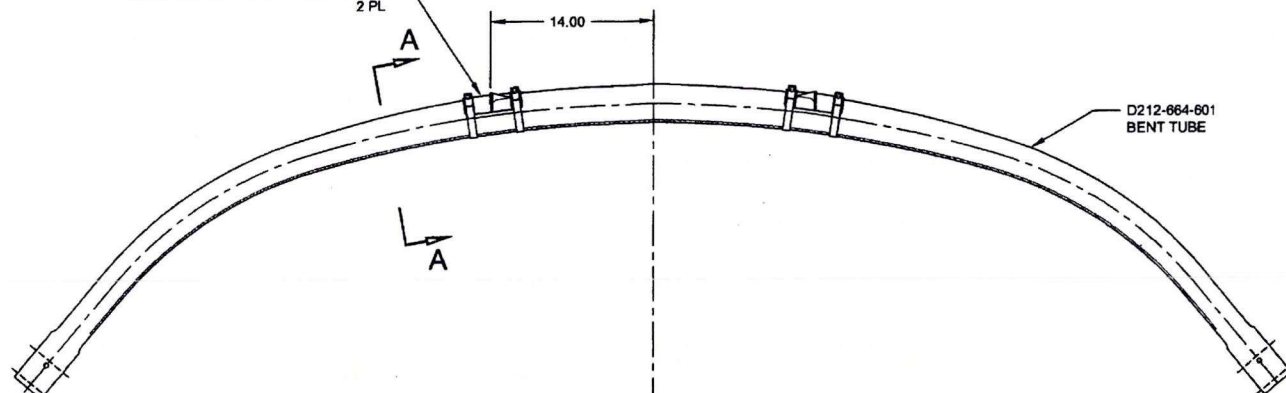
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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                 |                        |
| DRAWING NO.<br>D212-664-241                                                                                                                                                                                                                                              | REV. E<br>SHEET 1 OF 5 |
| TITLE<br>CROSSTUBE ASS'Y (205/212 HI AFT)                                                                                                                                                                                                                                | SCALE<br>NTS           |
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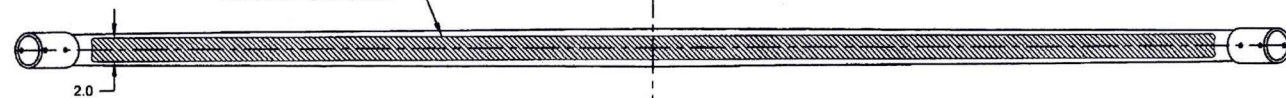
D  
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13 14 15  
D2940-1 SUPPORT  
MS21920-28 CLAMP, 2X  
D3595-063-530 RUBBER CUSHION, 2X  
2 PL



D212-664-601  
BENT TUBE

MASK AREA PRIOR TO PAINTING,  
REMOVE MASKING AFTER PAINT  
AND APPLY CLEAR COAT



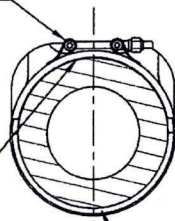
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SYM

**D212-664-241  
ASSEMBLY DETAIL**

E MS21920-28  
CLAMP, REF  
14 15

E 13  
APPLY PROSEAL  
BETWEEN D2940-1 AND  
CROSSTUBE



D2940-1  
SUPPORT, REF

D3595-063-530 RUBBER CUSHION  
UNDER CLAMP, REF

**SECTION A-A**  
SCALE 4X

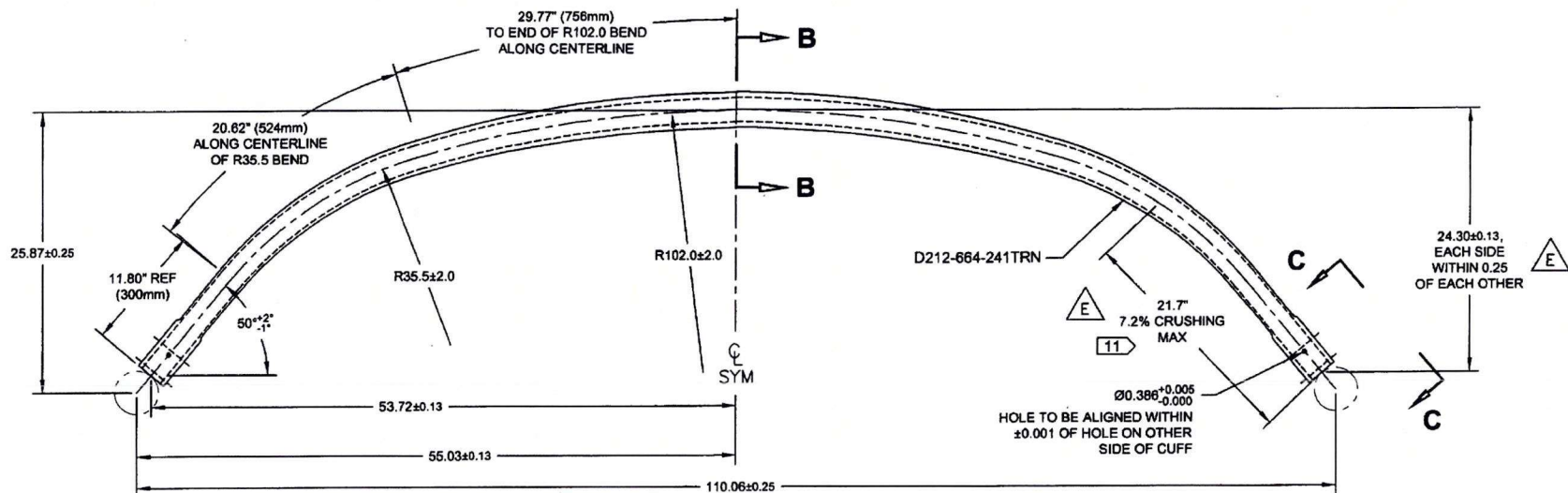
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| DESIGN     |          | <b>DART AEROSPACE LTD</b>                                                                                                                                                                                                                                                                             |              |
| DRAWN      |          | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                                                           |              |
| CHECKED    |          | DRAWING NO. D212-664-241                                                                                                                                                                                                                                                                              | REV. E       |
| MFG. APPR. |          | TITLE                                                                                                                                                                                                                                                                                                 | SHEET 2 OF 5 |
| APPROVED   |          | CROSSTUBE ASS'Y (205/212 HI AFT)                                                                                                                                                                                                                                                                      | SCALE        |
| DE APPR.   |          |                                                                                                                                                                                                                                                                                                       | NTS          |
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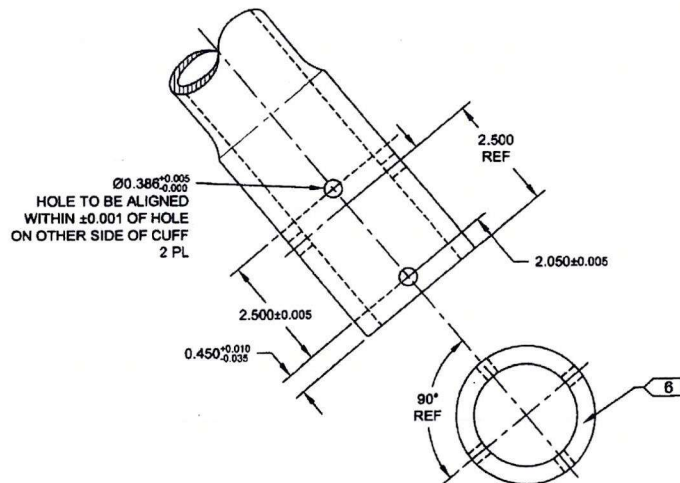
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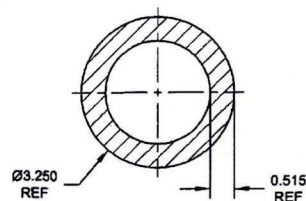




**D212-664-601** 11  
**BENDING AND DRILLING DETAIL**



**VIEW C-C: CUFF DETAIL**  
 SCALE 3X



**SECTION B-B**  
 SCALE 4X

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|            |           |                                                                                                                                                                                                                                                                                         |              |
|------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | <i>JP</i> | <b>DART AEROSPACE LTD</b>                                                                                                                                                                                                                                                               |              |
| DRAWN      | <i>JP</i> | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                                             |              |
| CHECKED    | <i>DL</i> | DRAWING NO. D212-664-241                                                                                                                                                                                                                                                                | REV. E       |
| MFG. APPR. | <i>JP</i> |                                                                                                                                                                                                                                                                                         | SHEET 4 OF 5 |
| APPROVED   | <i>JP</i> | TITLE                                                                                                                                                                                                                                                                                   | SCALE        |
| DE APPR.   | <i>JP</i> | CROSSTUBE ASS'Y (205/212 HI AFT)                                                                                                                                                                                                                                                        | NTS          |
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Entered: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. \_\_\_\_\_

Route update only ☐

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                        |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------|--|
| Job: _____<br><br>Part No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/> | <b>DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/> </div> <div>           Eng. (Non-AW) <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Water Jet <input type="checkbox"/><br/>           Supplier <input type="checkbox"/><br/>           Quality <input type="checkbox"/> </div> </div> |  |                        |  |
| Date : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Sequence #: _____                                                                                                                 | QTY Affected : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | MRB (QSI042)           |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                   | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | Completed By           |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | Lead hand / Supervisor |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                        |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | QC / QA Coordinator    |  |
| <b>Root Cause</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Operator <input type="checkbox"/><br/>           Manufacturing Process <input type="checkbox"/><br/>           Equip/Tooling <input type="checkbox"/><br/>           Handling/Preservation <input type="checkbox"/><br/>           Material <input type="checkbox"/><br/>           Product Improvement <input type="checkbox"/><br/>           Process Improvement <input type="checkbox"/><br/>           Human Factors <input type="checkbox"/> </div> <div> <input type="checkbox"/> Pressure/Forced<br/> <input type="checkbox"/> Bending<br/> <input type="checkbox"/> Crushing<br/> <input type="checkbox"/> Cracks<br/> <input type="checkbox"/> Crimp/Kink/Ripple/Wave/Twist<br/> <input type="checkbox"/> Marks/Chatter<br/> <input type="checkbox"/> Mislabeled         </div> <div> <input type="checkbox"/> Contamination<br/> <input type="checkbox"/> Misaligned/off center<br/> <input type="checkbox"/> BOM/Route<br/> <input type="checkbox"/> Broken/Damage/Defect<br/> <input type="checkbox"/> Incomplete/Unclear Instructions<br/> <input type="checkbox"/> Drill Holes<br/> <input type="checkbox"/> Fit/Function         </div> <div> <input type="checkbox"/> Power Loss/Surge<br/> <input type="checkbox"/> Folio/Program<br/> <input type="checkbox"/> Grain Direction<br/> <input type="checkbox"/> Weld<br/> <input type="checkbox"/> Wrong Stock Pulled<br/> <input type="checkbox"/> Out of Sequence<br/> <input type="checkbox"/> Off-set/Set-up         </div> <div> <input type="checkbox"/> Positioned Wrong<br/> <input type="checkbox"/> Outside Tolerance<br/> <input type="checkbox"/> Drawing<br/> <input type="checkbox"/> Finish<br/> <input type="checkbox"/> Part Lost/Missing<br/> <input type="checkbox"/> Misread         </div> </div> |                                                                                                                                   | Other/Details: _____<br><br>_____<br><br>_____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                        |  |